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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,311	08/12/2005	Tadahiro Ishizaka	263194US3PCT	3893
22850	7590	12/27/2006		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CHANDRA, SATISH	
			ART UNIT	PAPER NUMBER
			1763	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/27/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/516,311

Applicant(s)

ISHIZAKA ET AL.

Examiner

Satish Chandra

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9 –17, 19 - 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Vincenzo et al (US 6,022,412).

Vincenzo et al discloses a process apparatus for forming a film, comprising:

A chamber 12 (fig 1), a plurality of gas inlets 22 (only one is shown) arranged approximately parallel with the direction of gas flow, for supplying a predetermined gas into the chamber (Column 6, lines 21 – 23), an exhaust opening 24 for expulsion of gaseous reagents (Column 6, line 24) for exhausting an interior of the chamber wherein the chamber is characterized in that the walls of the reaction chamber may converge in the direction of the principal gas flow imposed by one or more inlets (Column 3, lines 45 – 49). The chamber 12 has an approximately triangular shape as seen from a direction approximately perpendicular to a direction of supply of gases wherein the supply gas

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opening is provided at substantially an entire one side of the cross section and the exhaust opening 24 being provided at a vertex portion.

Structure of the chamber inherently ensures that the thickness of the boundary layer on a wall of the chamber that extends along a direction of flow of the gases and on a substrate placed in the chamber approximately parallel to the direction of flow of gases is approximately constant. And the gases are supplied in a manner that the gas has a cross section of flow passage that decreases in accordance with a distance from the gas supply opening 22.

The processing apparatus wherein the cross section of the flow passage is formed so as to be in reverse proportion to a distance from the gas supply section and width of the chamber is approximately constant but the height of the chamber decreases along the direction of the gas flow (fig 1).

Claims 9 – 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tadaitsu et al (JP 08-279465).

Tadaitsu et al discloses a process apparatus for forming a film (Fig 1), comprising:

A chamber (fig 1), a gas inlet (upstream of gas exit cone 3) arranged approximately parallel with the direction of gas flow, for supplying a predetermined gas into the chamber, an exhaust opening 4 for expulsion of gaseous reagents for exhausting an interior of the chamber wherein the chamber is characterized in that the walls of the reaction chamber may converge in the direction of the principal gas flow imposed by one or more inlets. The chamber has an approximately triangular shape

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(Fig 1) as seen from a direction approximately perpendicular to a direction of supply of gases wherein the supply gas opening is provided at substantially an entire one side of the cross section and the exhaust opening 4 being provided at a vertex portion.

In Para 0007, **Tadaitsu et al** further teaches that the invention approach keeps the thickness of the boundary layer constant to a flow direction by passing material gas to a wafer. Therefore, the structure of the chamber inherently ensures that the thickness of the boundary layer on a wall of the chamber that extends along a direction of flow of the gases is also approximately constant. And the gases are supplied in a manner that the gas has a cross section of flow passage that decreases in accordance with a distance from the gas supply opening, upstream of gas exit cone (diffuser plate) 3.

The processing apparatus wherein the cross section of the flow passage is formed so as to be in reverse proportion to a distance from the gas supply section and width of the chamber is approximately constant but the height of the chamber decreases along the direction of the gas flow (fig 1).

Tadaitsu et al further teaches a gas diffusion section (upstream of gas exit cone 3 in Fig 1) wherein the diffuser plate 3 consists of a plurality of gas supply holes arranged approximately parallel with the direction of width of the chamber.

Claims 9 –17, 19 - 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Kilpela et al (US 2005/0092249).

Kilpela et al discloses an ALD reactor 10 (Fig 1, 2) comprising:

A chamber 12 (fig 1), a plurality of gas inlets 20 and 22 (Paras 0035, 0036) arranged approximately parallel with the direction of gas flow, for supplying a predetermined gas into the chamber, an exhaust passage 23 for expulsion of gaseous reagents (Para 0036) for exhausting an interior of the chamber wherein the shower head has a variable thickness, converging in the direction of the principal gas flow imposed by one or more inlets (Fig 3A). The chamber 12 with the converging shower head (Fig 3 A) has an approximately triangular shape as seen from a direction approximately perpendicular to a direction of supply of gases wherein the supply gas opening is provided at substantially an entire one side of the cross section and the exhaust opening 23 being provided at the truncated vertex portion.

Structure of the chamber with converging showerhead (Fig 3A) inherently ensures that the thickness of the boundary layer on a wall of the chamber that extends along a direction of flow of the gases and on a substrate placed in the chamber approximately parallel to the direction of flow of gases is approximately constant. And the gases are supplied in a manner that the gas has a cross section of flow passage that decreases in accordance with a distance from the gas supply openings 20 and 22.

The processing apparatus wherein the cross section of the flow passage is formed so as to be in reverse proportion to a distance from the gas supply section and width of the chamber is approximately constant but the height of the chamber decreases along the direction of the gas flow (fig 3A).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincenzo et al (US 6,022,412) in view of Anderson et al (US 5,916,369).

Vincenzo et al was discussed above.

Vincenzo et al does not teach a processing apparatus wherein the gas supply section includes a gas diffusion section connected to the gas supply holes.

Anderson et al teaches:

A manifold 100 with a diffuser plate 104 wherein the diffuser plate 104 has an upper and a lower row of circular holes 112 formed therein (Figs 3, 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a gas diffusion manifold (section) in the apparatus of Vincenzo et al as taught by Anderson et al.

The motivation to provide a gas diffusion manifold is to provide an improved gas inlet to improve the uniformity of gas flow as taught by Anderson et al.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kilpela et al (US 2005/0092249) in view of Anderson et al (US 5,916,369).

Kilpela et al was discussed above.

Kilpela et al does not teach a processing apparatus wherein the gas supply section includes a gas diffusion section connected to the gas supply holes.

Anderson et al teaches:

A manifold 100 with a diffuser plate 104 wherein the diffuser plate 104 has an upper and a lower row of circular holes 112 formed therein (Figs 3, 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a gas diffusion manifold (section) in the apparatus of Kilpela et al as taught by Anderson et al.

The motivation to provide a gas diffusion manifold is to provide an improved gas inlet to improve the uniformity of gas flow as taught by Anderson et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m..

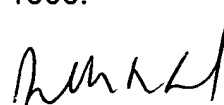
If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund can be reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Satish Chandra



Jeffrie R. Lund

Primary Examiner

SC

12/19/2006